

ZERO, BEAT

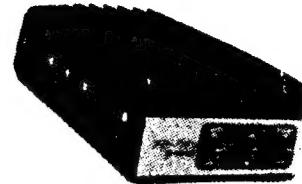
HAMPDEN COUNTY RADIO ASSOCIATION, INC

WL-QSL BUREAU

SPRINGFIELD, MASS

ARRL AFFILIATED, 35th YEAR

HAM RADIO AUCTION!



FRIDAY NOVEMBER 4TH, 1983

GRANGER SCHOOL
FEEDING HILLS, MASS
(On a Diagonal from the F.H. Cong Ch.)

Doors open at 7pm, Auction starts promptly at 8!

RULES:

- All items must be clearly labeled with your name or call.
- Club takes 10% of all sales.
- Minimum bids may be marked on items. Seller may bid to protect his own item. No charge if seller buys his own item. (HOWEVER, we will only try to sell each item ONCE! No one will be allowed to buy and then put the item back in for re-sale.)
- Items donated to the club should be clearly labeled "DONATION". Tax receipts will be available.
- Seller guarantees the item, not the club.



AUCTIONEER HAS THE FINAL SAY ON ALL SALES. DISPUTED ITEMS WILL BE PUT UP FOR BID ALL OVER AGAIN.

It's OK to put interesting information on an item to help the auctioneer get a better price. For example, if the rotor you're selling is new, write it on the item.

DX

NEXT ISSUE OF ZERO BEAT:

-W1KK's OSCAR ANTENNA, Part II
-OSCAR AO-10 ARTICLE
-AND MORE!

OSCAR AO-10 INFO!

The Mode L transponder (uplink: 1269.050-1269.850 MHz; downlink: 436.950-436.150 MHz) will be tested shortly. OSCAR 10's Mode L transponder will be tested shortly.

Amateurs active in satellite communications might be interested in the AMSAT QSL Bureau. All that you need are a few number 10 (business-size) s.a.s.e.'s on file. For more information, contact Perry Yantis, WB8OTH, 1850 Lisleave, Obetz, OH 43207. Please enclose an s.a.s.e. for your reply.

At the request of AMSAT, W1AW bulletins have moved into OSCAR 10's L2 channel. Listen for cw bulletins, when the satellite is within range, on 145.840 MHz.

St. Paul Island: VE1ASJ and crew are planning a 10-day DXpedition to St. Paul Island beginning September 23.

United Arab Emirates: A6XJC will be returning from Germany and should be back on the air by September 4. QSLs go to PE0MGM.

Norfolk Islands: VK9NS will be signing VK9WCY for the next two months from the Norfolk Islands to commemorate the World Communications Year.

Eastern Caroline Islands: KC6RN from Yap Island has been on 21300 kHz around 0000Z and on 21025 kHz around 0100Z. QSLs go to JH1RNZ.

Rwanda: 9X5WP, Wes, has been worked on 21275 kHz around 1900Z. QSL to WB6VKD. Also, K4YT plans to operate from 9X5, but has been delayed about 10 days.

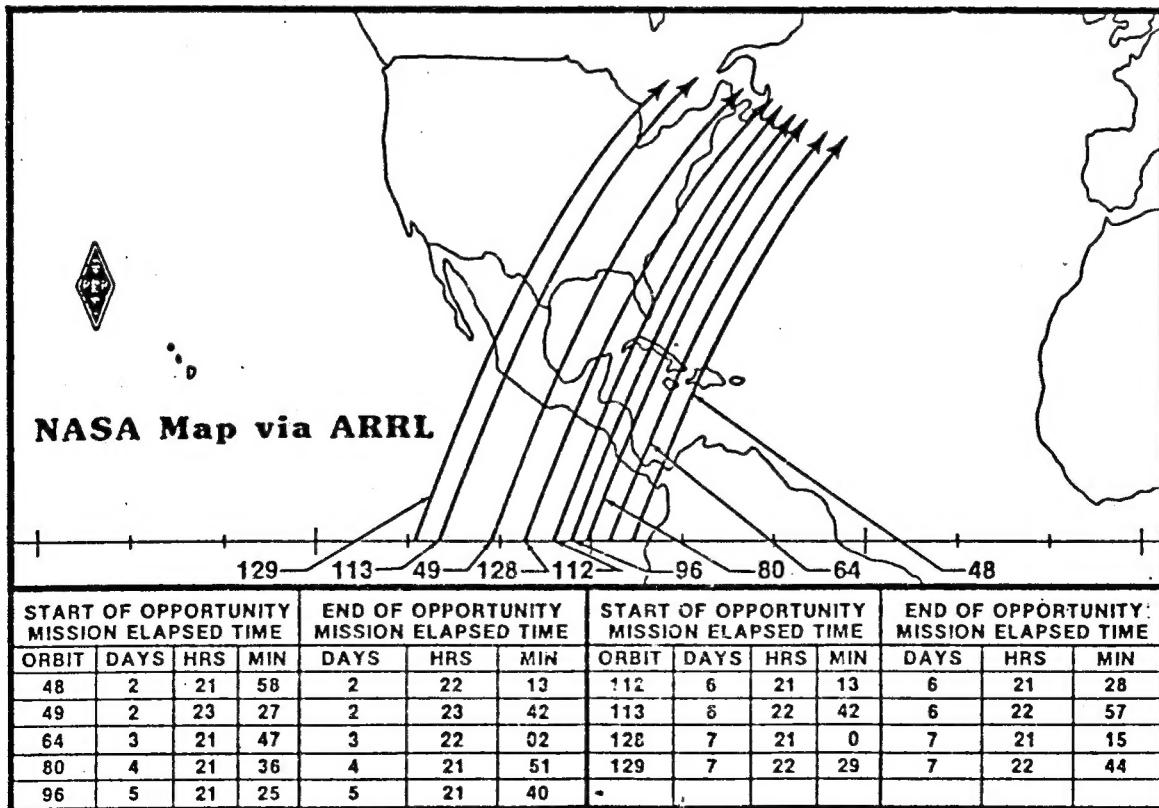
Lesotho: Rich, 7P8BO, has been operating from Lesotho on 21385 kHz around 1615Z.

Egypt: 9Y4RD/SU, Roger, has been contacted on 14205 kHz around 2100Z. QSLs go to KA2DDJ.

Hong Kong: VS6GZ has been on 14216 kHz around 1250Z. QSLs for Guenter go to OE1HGC.

Thanks in part to K1MM, K1MEM, W1TRC & N1AJO of the So. New England DX Assoc.

STS-9 AMATEUR RADIO DEMONSTRATION GROUND TRACK LOCATOR U. S. OPPORTUNITIES



Space antenna

The STS-9 antenna to be used by Dr. Garriott, W5LFL is a copper ring, approximately 9 inches in diameter. This is formed from $\frac{1}{4}$ -inch copper and is a split ring at the ends. One end of the circle is grounded in the typical DDRR configuration, and a few inches from this same end the center pin of a type N connector is connected to supply the RF. The "N" connector enters through the rear of the box. The other end of the antenna circle is insulated from ground. This antenna is enclosed in an aluminum box approximately 24" H \times 24" W \times 4" D. There are flanges attached to the edges of the box.

The window of the orbiter has Velcro strips that normally provide attachment of a sun visor. The window is in the ceiling of the orbiter. These same strips will be used to mate with Velcro "C" clips that are mounted on the box flanges.

The Turnstile Antenna and STS-9

W5LFL will be operating nbfm in the 2-meter band on frequencies centered on 145.34 MHz. The August QST article gives information on how contacts will be conducted and indicates suitable equipment for making contacts. The QST authors suggest a turnstile antenna but include no constructional dimensions. A turnstile is a pair of horizontal crossed dipole elements fed for circular polarization and placed above a plane reflector, shown in Fig. 1. At high radiation angles the polarization is truly circular. The elements should be a half wave in length (39 inches), and may be of no. 12 wire, small rod or tubing. The reflector should be 48 inches square.

The spacing between the elements and the reflector plane is not critical, but will affect both the vertical-plane radiation pattern and the feed-point impedance. I suggest a spacing of $3/8$ wavelength (30.5 inches). At this spacing the array will have the most gain at angles below the zenith. (In the broad range of 30 to 60 degrees above the horizon, the response will be within 1 dB of maximum.) At the zenith, where the spacecraft will be nearer and less antenna gain therefore required, the response will be down about 3 dB from maximum.

With a reflector spacing of $3/8$ wavelength, each element will have a radiation resistance of approximately 95 ohms. The two elements have essentially no mutual coupling, and are interconnected with a $1/4$ -wave 75-ohm phasing line. This line, including connectors, should be 13.4 inches long if of solid polyethylene dielectric, or 16.25 inches for foamed dielectric. If a minimum SWR of 1.4:1 can be tolerated, 52-ohm line may be brought from the shack directly to one of the two elements. Otherwise, use a $1/4$ -wave matching section of 52-ohm line (length as above) connected from

The antenna will emit vertical polarization, as do all DDRR antennas, but the important objective is to get the RF out of the vehicle. The position of the orbiter, of course, will determine where vertical is in respect to Earth.

To reduce any RF leakage into the orbiter, wide mylar tape strips approximately $1\frac{1}{2}$ feet long are taped in a radial pattern to function as RF chokes. These are attached to the flanges and the panels around the window from the flange.

— Eric Olseen, W4BNQ; J.D. Collner, W4GNC; and Carl Zelich, AA4MI. □

TNX, Worldradio

one of the elements to the end of a 75-ohm line coming from the shack. The SWR in the 75-ohm feeder will be near 1:1 at antenna resonance.

Many amateurs have wondered which is the preferred circularity for the turnstile, right-hand or left-hand. When used for STS-9 communications it will make no difference, as W5LFL will be using a loop antenna (linearly polarized). Yes, this does mean you'll be losing 3 dB of signal with circular polarization, but it also means you won't have to guess or experimentally determine how to orient a linearly polarized antenna to compensate for the attitude of the spacecraft and for Faraday rotation of the signals during propagation. That's one less detail you'll need to worry about during those few short minutes of access time per pass of Columbia.

At least one antenna manufacturer offers an antenna designed specifically for this type of space communications. Cushcraft of Manchester, NH, has recently announced the ATS-1 Shuttle Turnstile Antenna. From the Cushcraft brochure it appears to be similar to the array of Fig. 1, except that the plane reflector is replaced by two crossed parasitic reflectors. All elements appear to be of tubing. The ATS-1 lists in the \$40 price class. -- Jerry Hall, K1TD.

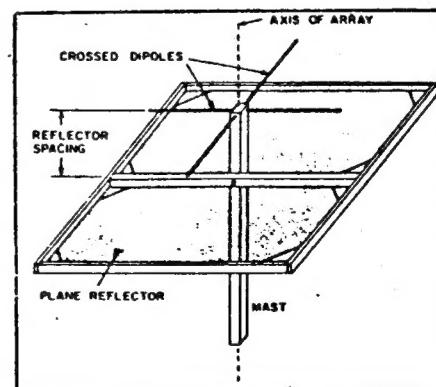


Fig. 1 -- The turnstile antenna consists of crossed dipoles above a screen reflector. The reflecting screen is 20-gauge hexagonal chicken wire, 1-inch mesh, stapled to a wooden frame made from furring strips. Hardware cloth may be used in place of the chicken wire. See text for dimensions.

TNX, QEX

THE TURNSTILE ANTENNA CONTINUED
 This information was extracted by W1KK from
 the ARRL TECHNICAL INFORMATION SERVICE.

CONSTRUCTION

Elements are 39 inches long. Wood is used for the frame, with 1/4-inch or 1-inch-mesh screen for the reflector. The phasing line is 13.4 or 16.25 inches, 70-ohm, and the matching section if used, is the same length, 52-ohm including the connector.

WIRING

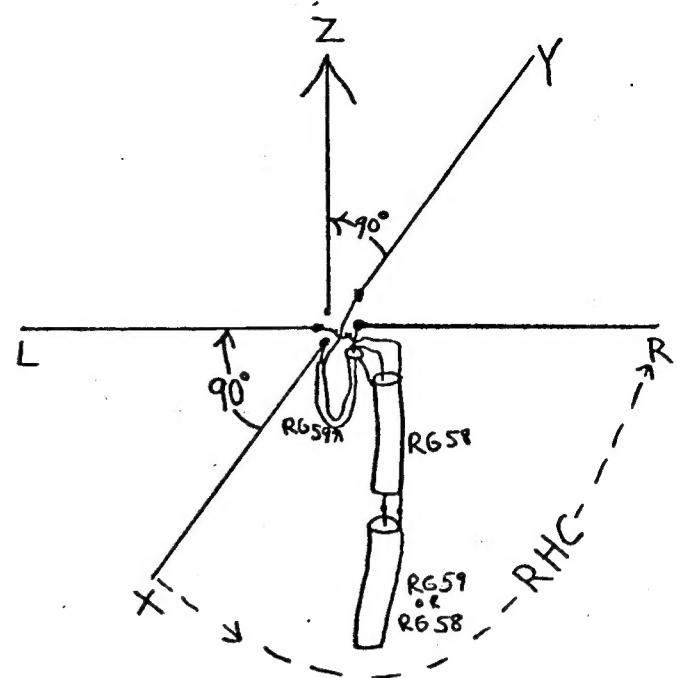
For right-hand circular polarization (RHC):
 Connect one end of the phasing line to one of the dipoles; i.e., fasten the center conductor to leg "X" and the shield to leg "Y". The "sense" (right-hand or left-hand) of the antenna will be determined by the position of the leg which receives the signal directly from the feedline, and thereby leads leg "X" (electrically) by 90 degrees. Connect the feedline and the other, free end of the phasing line in parallel, with center conductors to leg "R" and shields to leg "L".

For left-hand circular polarization (LHC):
 Use the same procedure, except that the (paralleled) feed- and phasing-line center conductors are connected to leg "L" and shields to leg "R".

NEWS FLASH: AS WE GO TO PRESS, THE SPACE SHUTTLE MISSION MAY BE POSTPONED! THIS WILL GIVE EVERYONE A LONGER TIME TO GET READY. SAVE THIS ISSUE OF ZERO BEAT BECAUSE WE WILL NOT BE REPEATING THIS INFORMATION!

For the past several Space Shuttle missions, Amateur Radio club stations associated with the National Aeronautics and Space Administration (NASA) have been retransmitting Space Shuttle communications carried over NASA's public affairs channel. They have been doing so under waivers granted by FCC specifically for each mission.

Now, any Amateur Radio station may retransmit Space Shuttle communications for the duration of all upcoming Space Shuttle flights launched under the auspices of NASA provided that: 1) permission is obtained from NASA prior to any such retransmissions; 2) the retransmitted



TURNSTILE, (Crossed-Dipoles)
 RIGHT-HAND CIRCULARITY
 (RHC) Shown looking from
 Ground UP. W1KK 12Oct83

communications are for the exclusive use of licensed radio amateur operators only. Both audio and video communications from the Shuttle may be retransmitted.

Cushcraft has come forward to offer a "store bought" turnstile antenna for the STS-9. The ATS-1 is an "all-aluminum" antenna rated at 100 watts. Reflector elements replace the screen to simplify construction and mounting. List price is \$39.95. Glen Whitehouse of Cushcraft expects to be shipping the antennas to dealers very early in October; so if you are interested, contact a Cushcraft dealer now and place your order.

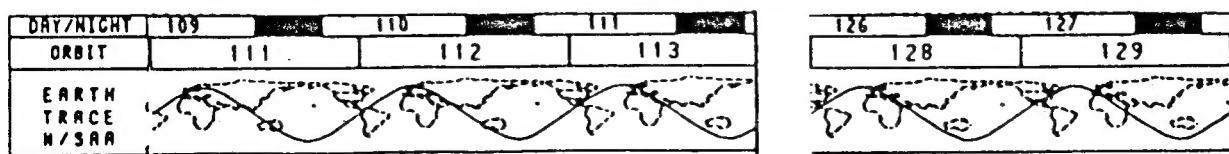
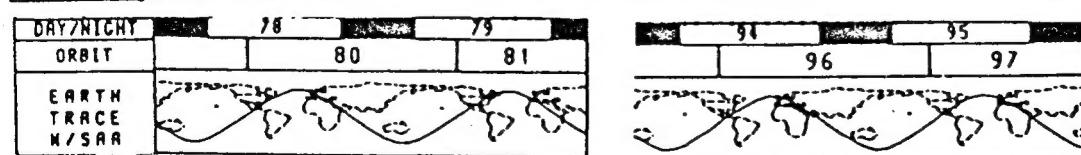
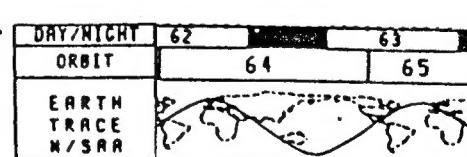
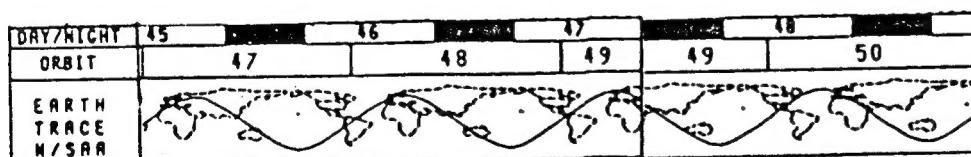
TNX, ARRL LETTER

WORKING THE SPACE SHUTTLE STS-9, W5LFL!

This information is accurate as of October 14th. Dr. Garriott, W5LFL, will transmit on 145.55 mhz with 145.53 and 145.57 as backup frequencies. He will listen to 144.91, 144.93, 144.95, 144.97, 144.99, 145.01, 145.03, 145.05, 145.07 and 145.09 mhz. Remember that these are the U.S. frequencies and only those frequencies will be monitored. He will not be listening on his transmit frequency. W5LFL will transmit for 60 seconds of each even minute, and will scan the 10 receive channels for the 60 seconds of each odd minute. (Set your clock to WWV) When calling, say "COLUMBIA/W5LFL" only once, followed by your call several times.

Detailed analysis of the STS-9 timeline dictates some changes to the proposed operating schedule. For operation to be possible, Dr. Garriott must be off-duty and awake and the COLUMBIA must be in the right attitude. Here are the orbits that are most probable for operation. The attached earth traces for each orbit are taken from the MISSION OPERATIONS DIRECTORATE (JSC 18176) STS-9 CREW ACTIVITY PLAN SPACELAB 1 FINAL JULY 22, 1983, so they are the most recent available.

<u>REV</u>	<u>MISSION ELAPSED TIME</u>					<u>AREA</u>		
	Ascending	DAYS	HOURS	MINUTES	to	HOURS	MINUTES	
48		2	21	58		22	13	East Coast
49		2	23	27		23	42	East to Mid-US
64		3	21	47		22	02	East Coast
80		4	21	36		21	51	East Coast
96		5	21	25		21	40	" "
112		6	21	13		21	28	" "
113		6	22	42		22	57	East to Mid-US
129		7	22	29		22	44	" " " "



Remember, this is only the "possible" operating times based on the "nominal" flight plan! Check W1AW for late news. Other sources of late breaking information are W5RRR (28.6, 21.37, 14.28, 7.23 and 3.85 mhz), the Scanner Association of America, (1-800-SCANNER) and the ARRL's information number. (203-666-0688) The AMSAT net meets locally on Tuesday at 9 pm, local time on 3850 khz.

TIDBITS

N1AFY brought an autographed picture of Dr. Owen Garriott, W5LFL, to the October meeting. Norm meet Dr. Garriott through his work on the NASA space suits...**K1BE** submitted an entry for the Special Service Club logo contest...**W1KK** busy designing new antennas for OSCAR ten work...**MT. TOM ARA** meets the third Friday of every month at the WMECO building on Brush Hill in West Springfield...**KA1BPF** passed advanced...Donate your old radio books to the local library. With budget cuts, they're desperate to keep up...**N8BQU** is moving to Columbus, Ohio...If your address label has a blue mark on it, this is the last issue you'll receive from us! Send your \$8.50 to Greg Stoddard, 1500 Mapleton Ave, Suffield, Ct 06078...**KA1CPG** passed General and then went back and passed advanced! FB, Leo!...**KA1JEA** bought a TS-520S...**WB1EMB** is now on six meters, look for him during the contests...**KA1T** is our new SM effective January first! Welcome! And many thanks to our outgoing SM, **W1JP**...

HELP US!

We need your help to make the auction a success! The profits go towards supporting ZERO BEAT. This year we'd also like to have the HCRA join AMSAT, which costs \$50.00 This will have to come out of healthy auction profits! What can you do? Bring a friend, talk up the auction, bring a few items to sell, join in the fun and actively support the auction. Many thanks.

1983 ARRL INTERNATIONAL DX CONTEST

Each year the HCRA participates in contests to get the ol' competitive juices flowin'! The ARRL International DX Contest is one our HF DX'ers go after. It's held on two different weekends, one for CW, one for phone. This year the HCRA scored 38th in the local club competition, with 52,923 points. Top club scorer, (and the top club DX'ER!) was **W1DGJ**! Many thanks to all who sent in logs:

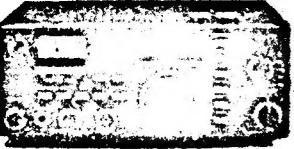
WB1ABF W1RED K1BE W1DGJ KA1DNX

LET'S GET MORE PEOPLE ON THE AIR FOR THE 1984 CONTEST! Where were all the CW operators?????? We need your help to boost the score.

"Quick As A Wink" Printing & Sales Co.

573 Union Street West Springfield, Ma. 01089





SELLING YOUR RADIO GEAR

There are many ways to sell your unwanted radio equipment, like the Collins S-line that has been gathering dust in the cellar! Club auctions, newsletters, flea markets are just a few things to try. What we are going to talk about in this article is where to sell things nationally. When comparing prices, only subscriber's rates and non-business ad costs are considered.

The best known way is through the "HAM ADS" in QST. At .25 cents a word you reach the most hams for the money! However, you must wait two months or more.

HAM TRADER YELLOW SHEETS are the way you may want to go. At .25 cents a word for subscribers, they publish every two weeks. In my opinion, this is the best place to buy or sell radio gear! You can get a special subscription of 4 issues/\$2.00, or buy a year at 24 issues/\$9.00.

WORLD RADIO has more in common with QST than any of the others because they carry articles, etc in a newspaper format. This is one of your best sources of articles on all the different aspects of amateur radio. Ads cost only .10 cents per word, and a subscription is 12 issues/\$10.00.

THE HAM BONEYARD is new, with a low price of 40 words/\$2.00, each word after that only .05 cents! It is published every four weeks. Subscriptions cost 12 issues/\$10.00

THE ELECTRONIC EXCHANGE has more computer equipment than anyone else. The ads cost .20 cents per word and a subscription is 12 issues/\$12.00.

THE SWAP LIST is new, with a price of .22 cents per word. Published monthly, subscriptions cost 12 issues/\$6.50.

If you know of any other national newsletters, drop us a note and we'll put it in the next **ZERO BEAT**. Here are the addresses of the above papers:

QST
c/o ARRL
225 Main Street
Newington, CT 06111

THE HAM BONEYARD
364 Kilpatrick Ave
Port St. Lucie, FL 33452

THE SWAP LIST
Box 988
Evergreen, CO 80439

HAM TRADER YELLOW SHEETS
P.O. Box 356
Wheaton, IL 60189

ELECTRONIC EXCHANGE
P.O. Box 486
Forest Lake, MN 55025

WORLD RADIO
2120 28TH Street
Sacramento, CA 95818

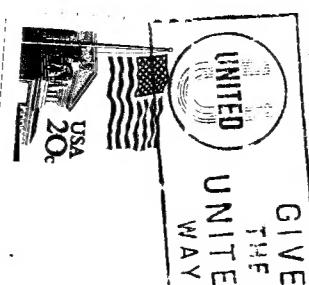
FIRST GLASS

NOVEMBER ISSUE

Jeffrey J. Duquette
P.O. Box 346
Southwick, Mass 01077

ZERO READ

10/15/83



HCRA 1983-84 SCHEDULE OF EVENTS

DATE:	RESPONSIBILITY:	TOPIC:
November 4th	WALEYP	ANNUAL AUCTION
December 2nd	-----	CHRISTMAS PARTY
January 6TH	ACIT	VHF STATIONS IN NEW ENGLAND; HOMEBREW NIGHT
January 15/16 (est. dates) VHF SWEEPSTAKES CONTEST		
February 4th	KAIKPH	USING THE HOME COMPUTER ON HAM RADIO.
ARRL INTERNATIONAL DX CONTEST February 18-19 CW March 3-4 PHONE		
March 4th	ACIT	POWER SUPPLIES; CB-TO-10 METER FM CONVERSION.
April 2nd	K1BE	RADIO REVIEW NIGHT; HOMEBREW NIGHT
May 7th (Saturday)		
June 3rd	WAIZKT	FLEA MARKET
June 3rd	WAIFY/NIAEH	ANNUAL BANQUET
June 25th/26th	ARRL FIELD DAY!!!!	

(SUBJECT TO CHANGE)